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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,058	11/06/2000	Otto Bach	5085-6	8298

7590

11/05/2003

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EXAMINER
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MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/707,058

Applicant(s)

BACH ET AL.

Examiner

Rodney G. McDonald

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 1-7, 11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-10 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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## **DETAILED ACTION**

### ***Election/Restrictions***

This application contains claims 1-7, 11 and 12 drawn to an invention nonelected with traverse in Paper No. 10. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boozenny et al. (U.S. Pat. 5,096,562) in view of Bentz et al. (U.S. Pat. 4,211,269) and Demukai et al. (Japan 05-125523).

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Boozenny et al. teach **a cylinder 59 which includes as its outside surface 61 the target material desired for a particular sputtering process.** For example, if a silicon based compound is desired to be formed as a film on the surface of a glass substrate 55, the cylindrical surface is made of silicon with a small percentage of impurities in order to make the surface electrically conductive. An aluminum concentration of 2% has been found satisfactory for a silicon target. Other popular target materials used in various glass coating applications include zinc and titanium. Generally, any target material that it being used in planar magnetrons can be used with the rotating cathode being described. (Column 4 lines 37-49)

Alternate techniques of forming the target surface 61 include **casting the entire tube 59 from the target material**, or by coating a supporting tube of a suitable nonmagnetic material, such as brass, with an outside layer of target material through plasma spraying. (Column 4 lines 50-55)

The difference between Boozenny et al. and the present claims is where the casting is centrifugal casting and where the grain structure has columnar crystallites arranged substantially perpendicular to a circumference.

Bentz et al. teach a method of **casting metal in the production of centrifugally cast tubes.** (See Abstract)

Bentz et al. teach casting of metal in a rotary mold or die of the kind which protection is provided simultaneously for the surface of the bath of metal and the space within the mould, prior to **casting**, by means of a controlled stream of liquefied inert gas which on the one hand is directed over the surface of the bath and which on the other

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hand is fed into the interior of the mould as it is driven in **rotation**. (Column 1 lines 5-15)

Centrifugal casting allows production of solidified layers of metal which are completely free from surface oxidation. (Column 2 lines 36-42)

The motivation for centrifugal casting is that it allows for the production of layers of metal that is free from surface oxidation. (Column 2 lines 36-42)

As to Applicant's required grain structure, it is believed that since Bentz et al. teach centrifugal casting which Applicants utilize that the grain structure would result in the same grain structure as Applicant's grain structure when using Bentz et al.'s centrifugal casting.

Demukai et al. teach forming a target material by melting a metal on a starting block 5 put in an annular furnace 3 with induction heating by using a high frequency induction coil 4 and the heat of the molten metal 1B is conducted from the block 5 side to form the solidified body 1C. The melting material 1A is supplemented from the upper part of the furnace 3 and the block 5 is pulled down to **continuously form the cast body**, and this cast body is cast almost perpendicularly to the continuous casting direction. By this method, **the target material having uniform structure, in which the direction of the macrocrystalline structure is almost perpendicular to the target surface 21, is obtained**. (See Abstract)

The motivation for having grains orientated perpendicular to the target surface is that it allows for a target with a uniform structure. (See Abstract)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Boozenny et al. by utilizing centrifugal casting as taught by Bentz et al. and to have utilized grains of a target orientated perpendicular to a target's sputtering surface as taught by Demukai et al. because it allows for production of a tube that has no oxidation on its surface and for an orientated target.

Claims 9, 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boozenny et al. in view of Bentz et al. and Demukai et al. as applied to claim 8 above, and further in view of Hartig et al. (U.S. Pat. 5,403,458).

The differences not yet discussed are where the target is made of a metal and a noble metal and where the body is formed of silver.

Hartig et al. teach a cathodic target that may be planar, square, round or ***cylindrical***. (Column 5 lines 54-55) Generally, cathode target are produced by several well known methods including extruding, ***casting***, liquid metal spraying, hot isostatic spraying, electroplating or plasma spraying. (Column 5 lines 61-64)

Cathode target includes a layer of material 20 comprised of at least two components; a coating component and a dopant component. (Column 6 lines 11-16) As the coating component silicon, aluminum, their alloys and mixtures can be utilized. Other coating components include aluminum, bismuth, chromium, boron, germanium, tin, titanium, tungsten, vanadium, zinc, zirconium, and certain combinations or alloys thereof. (Column 6 lines 37-44)

The dopant component can include noble metals, highly oxidation resistant metals and elements which form conductive oxides and conductive nitrides. Metals such as **silver**, gold and platinum are highly unreactive, i.e., will, not typically form reaction products, but are themselves substantially electrically conductive. (Column 7 lines 5-12)

The motivation for providing a cathode of a metal and a noble metal where the noble metal is of silver is that it allows for protecting the anode. (Column 3 lines 1-30)

Therefore, it would have been obvious at the time the invention was made to have utilized a cathode of metal and a noble metal where the noble metal is silver as taught by Hartig et al. because it allows for protecting the anode.

### ***Response to Arguments***

Applicant's arguments filed 8-29-03 have been fully considered but they are not persuasive.

In response to the argument that Boozenny et al. do not teach grains orientated perpendicular to a circumference of a the hollow target body, it is argued that Boozenny et al. teach that the hollow tube target can be cast. Bent et al. suggest utilizing centrifugal casting as a method for making cast hollow tubes. Centrifugal casting achieves Applicant's grain structure. Therefore, Boozenny et al.'s casting includes centrifugal casting as disclosed by Bent et al. and could include Applicant's required grain structure which Applicant requires. (See Boozenny et al. and Bent et al. discussed above) Furthermore, Demukai et al. suggest that target grains orientated

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perpendicular to the sputtering surface produce uniform targets for sputtering. (See Demukai et al. discussed above)

In response to the argument that Bentz et al. do not teach centrifugal cast tubes to be used as sputtering targets, it is argued that Boozenny et al. suggest that cast tubes can be utilized for sputtering targets. (See Bentz et al. discussed above)

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 703-308-3807. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 703-308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
November 3, 2003